

CLAIMS

What is claimed is:

- 5 1. An electronic component assembly, comprising:
a flexible printed circuit; ✓
a first component electronically coupled with the flexible printed circuit;
a second component electronically coupled with the flexible printed circuit, the
flexible printed circuit folded to position the components in generally mutually facing
10 relation; and, ✓
an inter-component thermal management device disposed between the
components, in thermal relation with the components, for removing or stabilizing
thermal energy from the components during operation.
- 15 2. The electronic component assembly of claim 1, wherein at least one of
the components is an electronic device, a memory device, a logic device or a
microprocessor.
- 20 3. The electronic component assembly of claim 1, wherein the components
are selected from a group consisting of an electronic device, a memory device, a logic
device and a microprocessor.
- 25 4. The electronic component assembly of claim 1, wherein the components
have identical or similar functionality in operation.
5. The electronic component assembly of claim 1, wherein the components
have a different functionality in operation.

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611, 17
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6. The electronic component assembly of claim 1, the assembly further comprising at least one second thermal management device thermally connected to the inter-component thermal management device.

5  The electronic component assembly of claim 1, the assembly further comprising at least one external signal communication interface on the flexible printed circuit for communicating signals between the components and external circuits.

8. An electronic component assembly, comprising:

10 ~~a flexible printed circuit;~~

a first modular section formed on the flexible printed circuit, comprising:

a first component electronically coupled with the flexible printed circuit;

15 a second component electronically coupled with the flexible printed circuit, the flexible printed circuit folded to position the components in generally mutually facing relation; and,

an inter-component thermal management device disposed between the components, in thermal relation with the components, for removing or stabilizing thermal energy from the components during operation;

20 a second modular section comprising:

a first component electronically coupled with the flexible printed circuit;

25 a second component electronically coupled with the flexible printed circuit, the flexible printed circuit folded to position the components in generally mutually facing relation; and,

a further inter-component thermal management device disposed between the components, in thermal relation with the components, for removing or stabilizing thermal energy from the components during operation, the flexible printed circuit being folded to form a stack of the modular sections.

30 9. The electronic component assembly of claim 8, wherein the components of the first modular section and the second modular section are disposed on a first side of the flexible printed circuit, and an inter-layer thermal management device is disposed

on a second side of the flexible printed circuit opposite to the first side, the flexible printed circuit being folded to form a stack of the modular sections and the inter-layer heat dissipation device.

5 10. The electronic component assembly of claim 8, wherein the components of the first modular section and the second modular section are disposed on a first side of the flexible printed circuit and a third modular section, similar to the first and second modular sections, is disposed on a second side of the flexible printed circuit opposite to the first side, the flexible printed circuit being folded to form a stack of the modular sections.

10 11. The electronic component assembly of claim 9, the assembly further comprising at least one second thermal management device thermally connected to at least one of the inter-component or the inter-layer thermal management devices.

15 12. The electronic component assembly of claim 11, wherein the second thermal management device is positioned adjacent to at least one of a front face or a side face of the assembly.

20 13. An electronic component assembly, comprising:
a flexible printed circuit;
a plurality of modular sections formed on the flexible printed circuit, each modular section comprising:
a first component electronically coupled with the flexible printed circuit;
a second component electronically coupled with the flexible printed circuit, the flexible printed circuit folded to position the components in generally mutually facing relation; and,
an inter-component thermal management device disposed between the components, in thermal relation with the components, for removing or stabilizing thermal energy from the components during operation, the flexible printed circuit being folded to form a stack of the modular sections.

14. The electronic component assembly of claim 13, wherein the modular sections are disposed on a first side of the flexible printed circuit and at least one inter-layer thermal management device is disposed on the second side of the flexible printed circuit opposite to the first layer, the flexible printed circuit being folded to form a stack of the modular sections and the at least one inter-layer thermal management device.

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15. The electronic component assembly of claim 14, wherein the modular sections and the inter-layer thermal management devices are positioned to result in an alternate arrangement of the modular sections and the inter-layer thermal management device in the stack.

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16. The electronic component assembly of claim 13, wherein the modular sections are disposed on a first side of the flexible printed circuit and a further plurality of modular sections are disposed on the second side of the flexible printed circuit opposite to the first layer, the flexible printed circuit being folded to form a stack of the modular sections.

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17. The electronic component assembly of claim 13, the assembly further comprising at least one second thermal management device thermally connected to at least one of the inter-component or the inter-layer thermal management devices.

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18. The electronic component assembly of claim 17, wherein the second thermal management device is positioned adjacent to at least one of a front face or a side face of the assembly.

19. A method of manufacturing an electronic component assembly comprising:

disposing a first electronic component on a first side of a flexible printed circuit;

disposing a second electronic component on the first side of the flexible printed

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circuit;

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folding the flexible printed circuit to bring the components into generally mutually facing relation; and

disposing an inter-component thermal management device between the components to remove or stabilize thermal energy from the components during operation.

5 20. The method of claim 19, wherein at least one of the components is a memory module.

10 21. The method of claim 19, wherein at least one of the components is a processor module.

15 22. The method of claim 19, wherein the first and second components are identical.

23. The method of claim 19, wherein the first and second components have a different functionality in operation.

20 24. The method of claim 19, further comprising disposing at least one second thermal management device in thermal connection to the inter-component thermal management device.

25 25. The method of claim 19, further comprising disposing an external signal communication interface on the flexible printed circuit for communicating signals between the components and external circuits.

26. A method of manufacturing an electronic component assembly comprising:

30 disposing a first electronic component of a first modular section on a first side of a flexible printed circuit;

disposing a second electronic component of the first modular section on the first side of the flexible printed circuit;

disposing a first electronic component of a second modular section on the first side of a flexible printed circuit;

5 disposing a second electronic component of the second modular section on the first side of the flexible printed circuit;

folding the flexible printed circuit to bring the components of the first modular section into generally mutually facing relation and the second modular section into generally mutually facing relation; and

10 disposing a first inter-component thermal management device between the components of the first modular section and disposing a second inter-component thermal management device between the components of the second modular section to remove or stabilize heat from the components during operation.

15 27. The method of claim 26, further comprising:

disposing an inter-layer thermal management device on a second side of the flexible printed circuit, opposite to the first side; and

folding the flexible printed circuit to dispose the inter-layer thermal management device between the first and second modular sections.

20 28. The method of claim 26, further comprising:

disposing a first electronic component of a third modular section on a second side of the flexible printed circuit, opposite to the first side;

disposing a second electronic component of the third modular section on the second side of the flexible printed circuit;

25 folding the flexible printed circuit to dispose the first and second electronic components of the third modular section into generally mutually facing relation; and

disposing an inter-component thermal management device between the components of the third modular section to remove or stabilize heat from the components during operation.

29. The method of claim 26, further comprising disposing at least one second thermal management device in thermal connection with at least one of the inter-component thermal management devices.

5 30. The method of claim 29, wherein the second thermal management device is positioned adjacent to at least one of a front face or a side face of the assembly.

31. A method of manufacturing an electronic component assembly comprising:

10 disposing a plurality of first electronic components on a first side of a flexible printed circuit, each of the first electronic components corresponding to a respective modular sections;

15 disposing a plurality of second electronic components on the first side of the flexible printed circuit, each of the second electronic components corresponding to the respective modular sections, so that each modular section comprises first and second electronic components;

folding the flexible printed circuit to bring the first and second components of the respective modular sections into generally mutually facing relation, thereby forming a stack of modular sections; and

20 disposing an inter-component thermal management device between the components of each modular section to remove or stabilize heat from the components during operation.

32. The method of claim 31, further comprising:

25 disposing a plurality of inter-layer thermal management devices on a second side of the flexible printed circuit opposite to the first layer; and

folding the flexible printed circuit to position an inter-layer thermal management device between adjacent pairs of the modular sections.

33. The method of claim 32, wherein the modular sections and the inter-layer thermal management devices are positioned to result in an alternate arrangement of the modular sections and the inter-layer thermal management devices in the stack.

5 34. The method of claim 31, further comprising the steps of:
disposing a further plurality of modular sections on a second side of the flexible
printed circuit opposite to the first side; and
folding the flexible printed circuit to form a stack of the modular sections.

10 35. The method of claim 31, further comprising the step of disposing at least
one second thermal management device in thermal connection with at least one of the
inter-component or the inter-layer thermal management devices.

15 36. The method of claim 31, wherein the second thermal management device
is positioned adjacent to at least one of a front face or a side face of the assembly.